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Environmental Protection Agency 1981-1990 ADP Requirements Study. Consolidated Systems Study Volume I. Executive Management Summary

Informatics, Inc, Rockville, Md.

Prepared for

Environmental Protection Agency, Washington, D.C.

14 Dec 77

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ENVIRONMENTAL PROTECTION AGENCY 1981 – 1990 ADP REQUIREMENTS STUDY

Consolidated Systems Study

Volume I

Executive Management Summary

Prepared For:

Environmental Protection Agency

Management Information and Data Systems Division

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16. Abstracts The purpose and objectives of the Environmental Protection Agency (EPA) Automated Data Processing (ADP) planning activities are to obtain the most cost-effective computing/telecommunications resources to meet EPA's computing requirements for the 1981 through 1990 time period. A detailed system study was performed, which identifies the current and projected ADP requirements for the period 1981 through 1990. Each ADP activity is identified utilizing Zero Based Budget (ZBB) decision units and then projected utilizing a multiple scenario approach. The final documents of this report are:

Consolidated Systems Study: Volume I - Executive Management Summary; Volume II - Detailed Report; Volume III - Appendices including microfiche details (3) fiche.
Consolidated Telecommunications Study: Volume I - Executive Management Summary; Volume II - Detailed Report; Volume III - Appendices including microfiche details (6) fiche.
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ENVIRONMENTAL PROTECTION AGENCY
1981-1990 ADP REQUIREMENTS STUDY
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VOLUME 1

Executive Management Summary

Final Report

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SECTION 1

INTRODUCTION

1.1 PROJECT PURPOSE AND OBJECTIVES

The purpose and objectives of the Environmental Protection Agency (EPA) Automated Data Processing (ADP) planning activities are to obtain the most cost-effective computing/telecommunications resources to meet EPA's computing requirements for the 1981 through 1990 time period. EPA has developed a comprehensive plan which follows the Office of Management and Budget (OMB) Circular A-109 (Major System Acquisition) process. The EPA plan addresses the following points:

- Detailed systems study, with total management participation, to establish the short- and long-term ADP needs, including computing/telecommunications and conversion requirements
- Development of an ADP acquisition strategy to obtain the necessary computing/telecommunications resources, including a detailed plan for evaluation of each step in the process
- Development of a Request for Proposal (RFP) to develop alternative system design concepts to meet EPA needs, including multiple awards for competitive concepts
- Demonstration of the selected system concepts to reduce risk and to determine total cost
- Procurement of the required resources and services which provide the greatest benefit to EPA, including conversion of all existing applications and operation of the new system

1.2 INFORMATICS ROLE

EPA selected Informatics to perform the detailed system

study, which identifies the current and projected ADP requirements for the period 1981 through 1990. This study has produced the following four documents as draft final reports:

- Phase I Final Report, dated April 8, 1977, which presents a detailed methodology and plan for conducting the ADP Requirements Analysis Study and for making the long term projections of requirements

- Phase II Final Report Consolidated System Study, dated December 14, 1977, which presents the detailed current EPA computing workload for each organization within EPA and estimates of the workload for the years 1979, 1981, 1985, and 1990 based on projected changes in mission, programs and ADP usage

- Phase II Final Report Consolidated Telecommunications Study, dated December 14, 1977, which presents the detailed current telecommunications workload between the ten EPA regional areas and the two computing facilities at Washington, D.C. and Research Triangle Park (RTP), and the projected changes in that workload for the years 1979, 1981, 1985, and 1990

- Phase II Final Report Conversion Study, dated December 14, 1977, which presents the impact and planning requirements for the agency in converting the existing ADP activities at the Washington Computing Center (WCC) and the National Computer Center (NCC) facilities to either compatible or non-compatible equipment

1.3 OVERALL REPORTS ORGANIZATION

The systems study's final reports are presented in the following series:

Consolidated System Study Report

- Volume I - Executive Management Summary
- Volume II - Detailed Report
- Volume III - Appendices

Consolidated Telecommunications Study Report

- Volume I - Executive Management Summary
- Volume II - Detailed Report
- Volume III - Appendices

Conversion Study Report

- Volume I - Final Report

1.4 ORGANIZATION OF THIS REPORT

This report is Volume I, the Executive Management Summary of the Consolidated System Study; it is organized as follows:

- Section 1: Introduction. A summary of project purpose and objectives report content and report organization
- Section 2: Study Methodology. A summary of the study approach, data gathered, and projections of future ADP workload
- Section 3: Current ADP Workload. A summary of organizational missions and supporting ADP workload
- Section 4: Projected ADP Workload. A summary

of organizational and mission changes and projected workload, with current and projected cost

- Section 5: Major Conclusions of the Study. A summary of the macro influences which will affect future ADP usage

- Section 6: System Acquisition Plan. A summary of the overall EPA plan to obtain the required computing/telecommunications resources

SECTION 2

STUDY METHODOLOGY

2.1 INTRODUCTION

The methodology used in the performance of this study consisted of the following tasks:

- Study of existing documentation
- Series of interviews with EPA management, ADP activity managers and computer service supplier personnel
- Verification of recorded data
- Analysis of data and conversion to quantitative terms
- Definition of mission responsibilities
- Projections of long term requirements
- Documentation of total findings

2.2 BASELINE WORKLOAD

During Phase I Orientation, Informatics identified approximately 190 computer systems and ADP activities from the 1977 EPA Zero Base Budget (ZBB) submission. This number represented approximately 80 percent of the total timesharing funds projected for use in FY 1978. A field visitation program was established to investigate these systems and other ADP activities at the regional offices, laboratories and headquarters organizations. The interview process identified and documented in excess of 250 ADP activities and documented over 200 interviews with EPA management at all levels. In addition, Informatics visited the two primary computing facilities, and identified through account numbers, the existing workload of each ADP activity. These data were then

extrapolated to a full year's data to obtain financial data and averaged to obtain a typical monthly workload.

2.3 PROJECTED WORKLOAD

The interview process with the individual ADP activity managers identified the changes necessary in the existing systems and obtained their workload projections for the 1979 period. These changes were applied to the 1977 baseline data to predict the 1979 values.

The EPA senior management interview results were converted to quantitative terms and presented as a set of projection factors for each organizational element. These values represented changes in ADP usage, mission and programs, as well as overall EPA growth. These factors were then applied to the 1977 baseline and added to the values for 1979, 1981, and 1985 respectively.

As a final step, the entire study methodology was presented to the ADP Planning Panel for review and modification, where necessary. Documented changes were then applied to the 1977 and 1979 baseline data and new projections were calculated.

2.4 MAJOR COSTING ASSUMPTIONS - INFLATION VERSUS TECHNOLOGICAL INNOVATION AND OTHER ASSUMPTIONS

Inflationary trends in the cost of ADP personnel and other services in recent years have largely been offset by technological improvements and reductions in the costs of ADP hardware, software and communications. ADP personnel costs have increased at a rate of 45 percent during the 1970 to 1976 period. Other ADP services such as cost of space, utilities, supplies, and furnishings have increased at approximately the same rate. However, the average cost of computing power has been reduced by almost 50 percent since 1965 and is expected

to continue to fall. Communication costs have also decreased by approximately 60 percent since 1960. Software costs have been reduced through the use of data base management systems.

The decreasing cost of data processing is expected to continue into the 1980s and this should offset the inflationary cost of personnel and other supplies and services. Comparing the cost of a job at NIH over the last ten years, we find that the costs have been relatively flat since 1971 (even during a period of high inflation in the country). Hardware efficiency and declines in equipment prices have offset other increases.

To develop long-term costs, the following basic assumptions were also necessary:

- Pricing policy would remain constant
- Added requirements would be fulfilled by identical equipment at basically the same cost
- Cost projections from activity managers would be used for 1979

SECTION 3

CURRENT ADP WORKLOAD

3.1 INTRODUCTION

Current ADP workload was developed from the computer utilization reports by account number and represents an average monthly usage. Computer workload is presented in "resource hours" for WCC (OSI/COMNET) operations and in "SUP hours" for the NCC facility. Although SUP and resource hours are not directly comparable, they come closest to encompassing the factors making up computer processing workload.

The WCC facility at COMNET (Washington, D.C.) handles the majority of the ADP workload for the regions, headquarters and the offices of Program Management; Enforcement; Water and Hazardous Materials; and Toxic Substances. The NCC facility is used primarily by the Office of Air and Waste Management. The Office of Research and Development workload is shared between the two facilities with the four Research Triangle Park (RTP) laboratories almost exclusively using the NCC facilities and the other laboratories using the WCC facility.

3.2 CURRENT WORKLOAD

The current ADP workload for each of the six assistant administrator's (AA) offices, regional offices and staff offices is presented in Figure 3-1. This chart illustrates both WCC and NCC activity; the dark areas represent WCC (IBM usage) and white areas represent NCC (UNIVAC usage). A summary of the ADP usage by each of the offices is as follows:

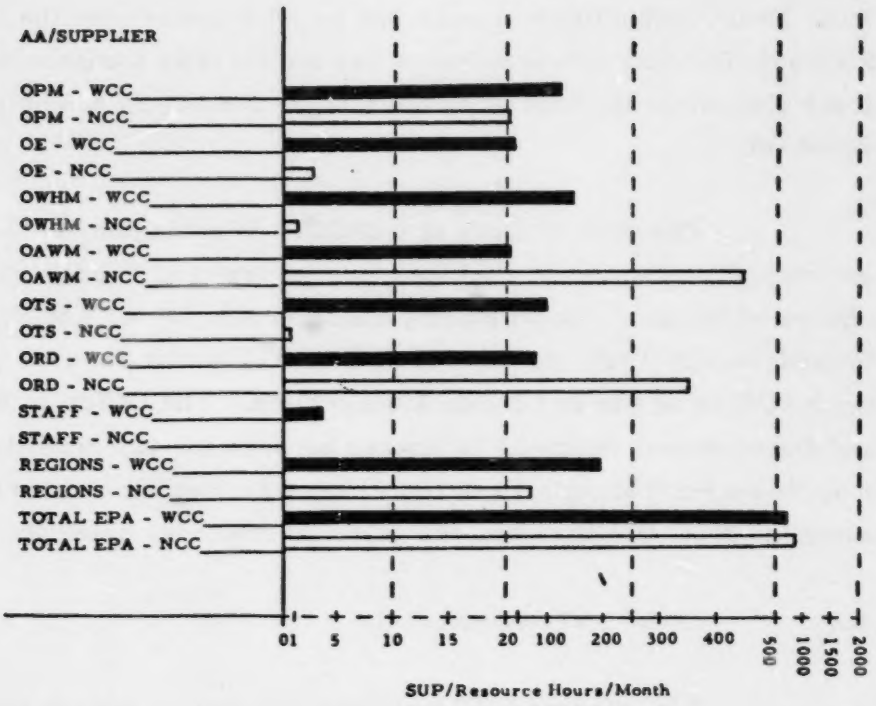

Figure 3-1. EPA Total Current Workload

- Office of Planning and Management (OPM). Responsible for overall agency administrative and management support activities. The Grants Information and Control System (GICS) is the largest ADP activity in this office. Other systems include general administrative, financial and resource management activities.

- Office of Enforcement (OE). Monitors compliance to standards for environmental quality in programs for air, water, pesticides, radiation, noise, and solid waste. ADP activities primarily involve tracking of facilities and their compliance to standards and pollution regulations.

- Office of Water and Hazardous Materials (OWHM). Develops standards and national policy for water and solid waste programs. Major ADP systems include STORET for national water quality monitoring, Construction Grants, and a series of water supply systems which will shortly be replaced by new systems responsive to the Safe Drinking Water Act of 1974.

- Office of Air and Waste Management (OAWM). Administers programs for research; standards development; and local assistance in air, noise, and radiation activities. Heaviest ADP activities are in air quality monitoring systems such as Storage and Retrieval of Aerometric Data (SAROAD), National Emissions Data System (NEDS), and the Energy Data System (EDS).

- Office of Toxic Substances (OTS). Develops policy and coordinates programs for testing, assessment, monitoring, regulations, and evaluation of chemical substances and pesticides. The prime ADP activities currently supporting OTS are the Mathematical Modeling and Statistical Analyses System for predicting and monitoring pollutant hazard levels, and the Pesticides Product Information System (PPIS).

- Office of Research and Development (ORD). Operates over 40 laboratory facilities nationwide to develop technical bases for environmental standards; measurement and quality control standards; pollution control technology; and methodologies for evaluating environmental management options. A variety of modeling, analysis, testing and tracking systems are used by ORD in their ADP activities.

- Staff Offices. A variety of offices support the EPA administrator in areas of judiciary, civil rights, federal activities, legal council, international activities, legislation, public affairs, and regional and intergovernmental offices. ADP activities monitor federal facilities and actions, and provide a public affairs mailing list.

- Regional Offices. Provide direction at the regional level for all Agency programs and exercise approval authority for state standards and plans. Major ADP activities in the regions and associated states involving national systems include STORET for water quality monitoring, GICS for construction grant monitoring, PCS for water enforcement monitoring, MSIS and FDRS for water supply monitoring, SAROAD for air quality monitoring, NEDS for emissions monitoring, CDS for air quality monitoring, SPCC for spill monitoring, ERSS and PEMS for pesticides monitoring, and FRS, PPS, and TSSMS for administrative monitoring. The other major national systems utilized by the regions are FMS, which is scheduled to be installed at WCC, and PMIS, which will be developed and installed at NCC. In addition to these national systems, each region has developed a number of supplemental systems to enhance program support not provided by the Headquarters efforts. A typical example is MICS for monitoring the issuance of water discharge permits.

SECTION 4

PROJECTED ADP WORKLOAD

4.1 INTRODUCTION

Each of the ADP activities expected to continue into the 1979 to 1990 time period is projected in terms of future workload. In addition new activities scheduled for implementation during this period are included.

Changes in mission, programs, ADP usage and overall EPA growth caused by legislation and administration support are included in the projected ADP growth rates.

4.2 ALTERNATIVE SCENARIOS

The interview process identified future growth rates based on various degrees of administration and public support. Three levels, called scenarios, were established and are defined as follows:

- Scenario I. This is considered to be equivalent to today's level of activity and growth within the agency and includes the viewpoint of the present administration, current economic outlook, energy programs, and public demand for environmental safeguards (normal scenario).

- Scenario II. This considers that the current situation will be augmented by increasing public demand and legislative action for environmental safeguards, caused by increasing public awareness of environmental problems and potentially some pollutant or toxic substance contamination of national significance (high growth scenario).

- Scenario III. This considers that the current situation will be modified because of shortages of critical resources such as energy, food, and water, which

would reduce agency programs to secondary concerns by establishing the highest priorities for production of life-supply resources (low growth scenario).

Each scenario reflects a change in the current EPA budget level and the levels available for ADP support.

4.3 PROJECTED WORKLOAD

The future workload projections are expressed in the same terms as current workload ("sup hours" for NCC and "resource hours" for WCC). These workload values are based upon existing hardware and reflect ADP requirements in terms of today's known computing values. Future workload is developed for the years 1979, 1981, 1985, and 1990.

Projected workloads for each of the six assistant administrator's offices, regional offices and staff offices are presented in Figures 4-1, 4-2 and 4-3. Each figure represents one of the three scenarios. These charts present both WCC and NCC activity; the dark areas represent IBM usage and the white areas represent UNIVAC usage.

The total agency ADP growth over the projected period is estimated to continue at a relatively high rate through 1979 and then at a more reduced rate from 1980 to 1990. While the overall pattern of growth remains the same with each scenario, the main difference is in the degree of growth. Increases in the initial period are caused by implementation of new programs in the regional offices (toxics, solid waste and water supply) and the offices of Enforcement (toxics in water, pesticides programs, and water supply); Water and Hazardous Materials (solid waste); and Research and Development (solid waste, toxics and energy). Recent legislation which impacts on these programs and causes ADP growth includes the Safe Drinking Water Act,

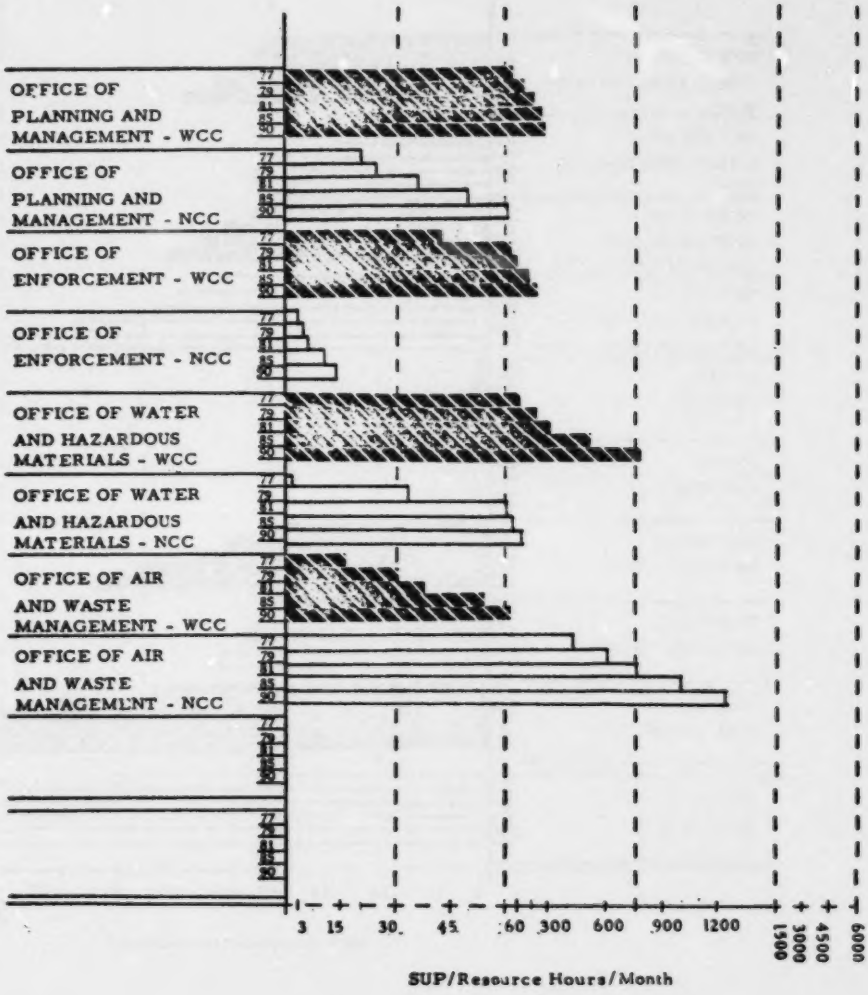
OFFICE OF PLANNING AND MANAGEMENT - WCC
OFFICE OF PLANNING AND MANAGEMENT - NCC
OFFICE OF ENFORCEMENT - WCC
OFFICE OF ENFORCEMENT - NCC
OFFICE OF WATER AND HAZARDOUS MATERIALS - WCC
OFFICE OF WATER AND HAZARDOUS MATERIALS - NCC
OFFICE OF AIR AND WASTE MANAGEMENT - WCC
OFFICE OF AIR AND WASTE MANAGEMENT - NCC
3 15 30 45 60 300 600 900 1200 1500 3000 4500 6000
SUP/Resource Hours/Month

Figure 4-1. Workload by Organization (AA) - Scenario 1

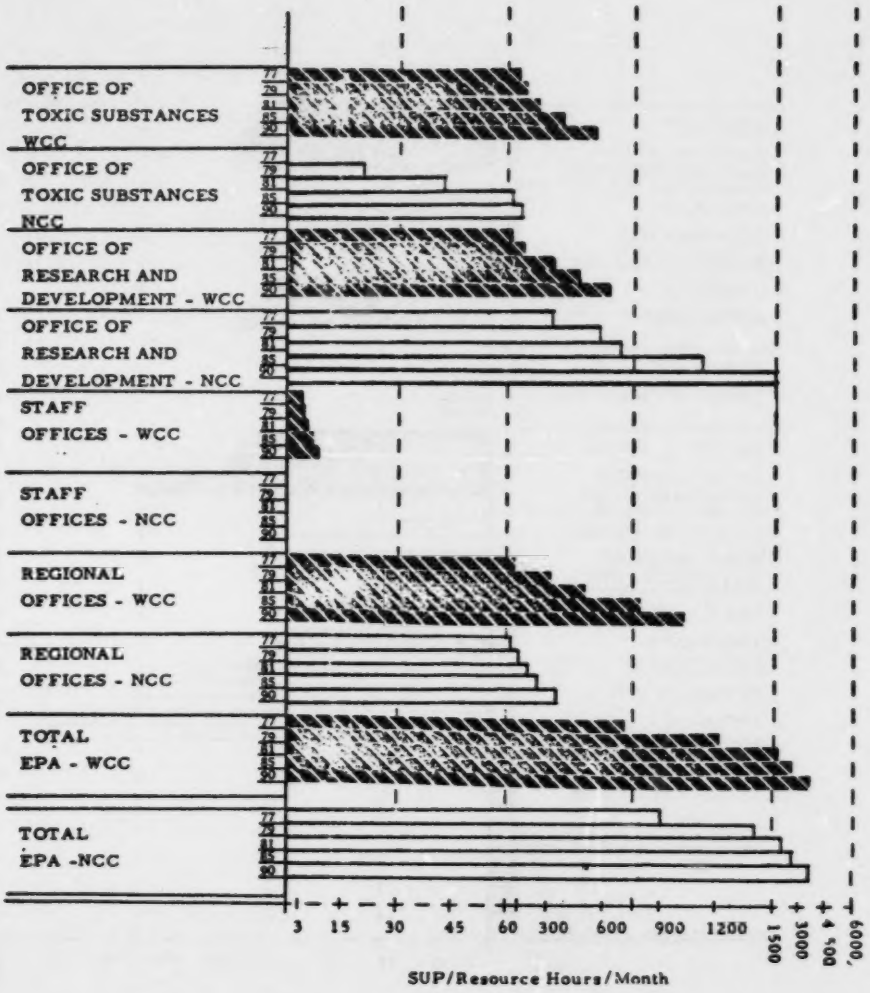

Figure 4-1. Workload by Organization (AA) - Scenario 1

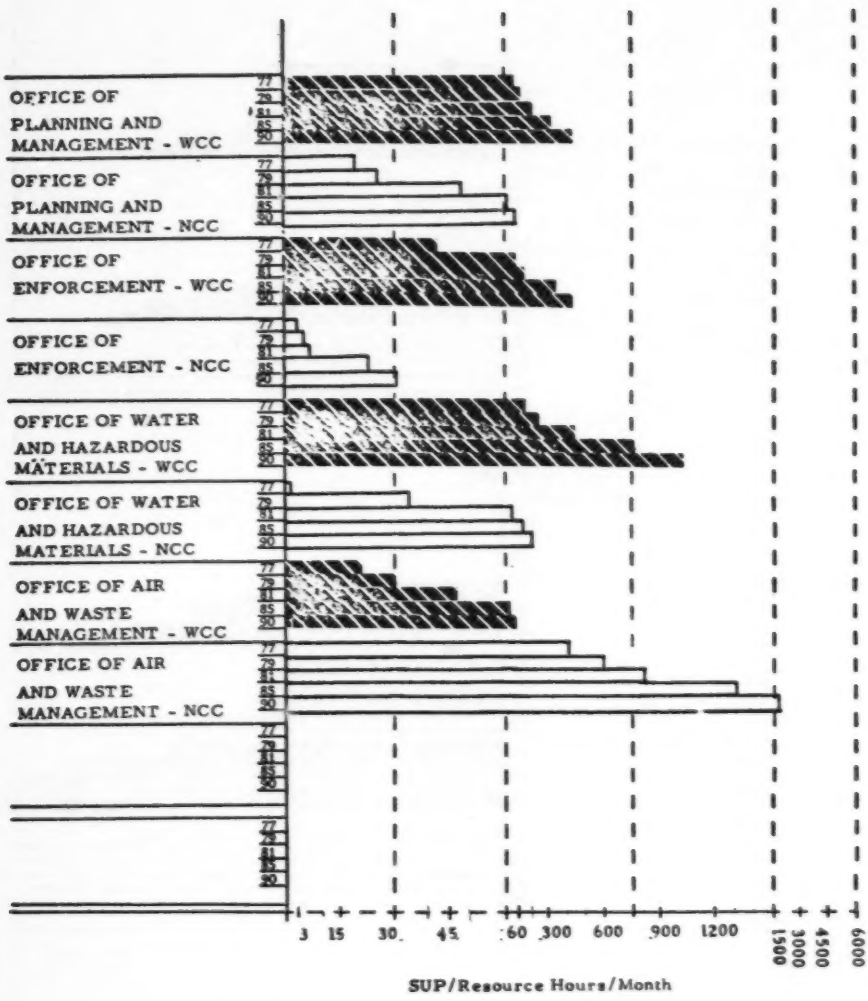

Figure 4-2. Workload by Organization (AA) - Scenario 2

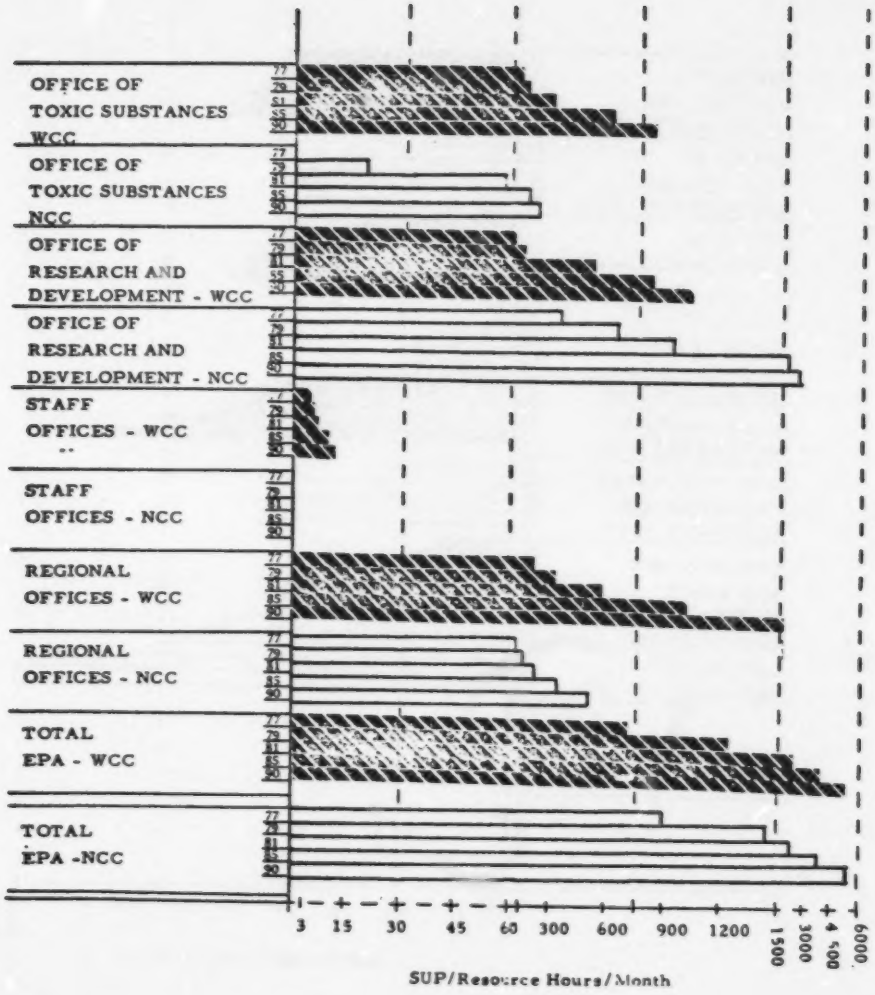

Figure 4-2. Workload by Organization (AA) - Scenario 2

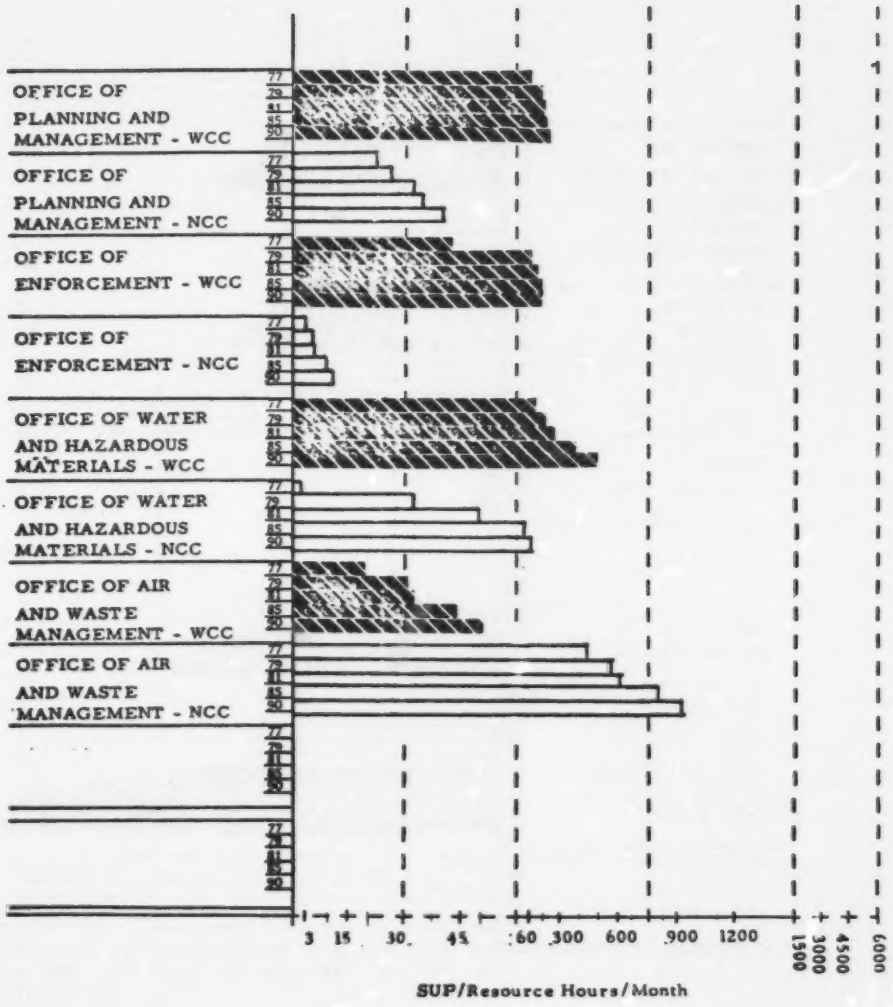

Figure 4-3. Workload by Organization (AA) - Scenario 3

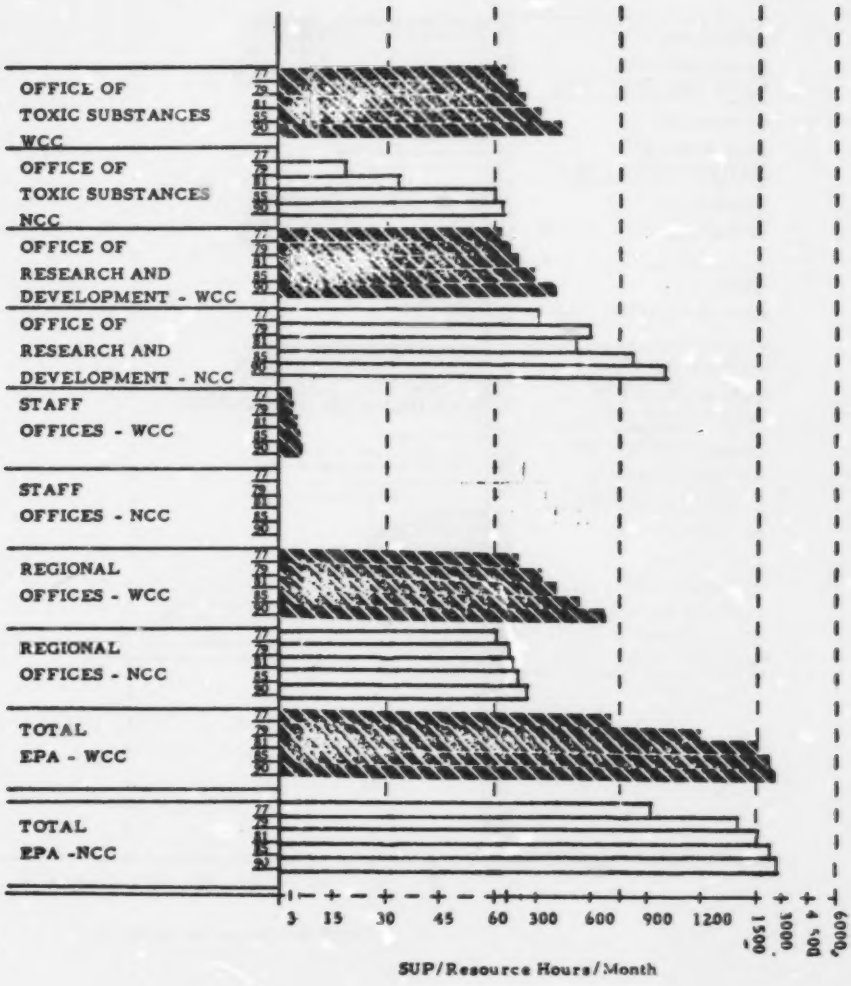

Figure 4-3. Workload by Organization (AA) - Scenario 3

the Resource Conservation and Recovery Act and the Toxic Substances Control Act.

The leveling of growth after 1979 is partially caused by shifting of air and water programs to the states and regions as local capabilities increase. Three of the regions and some of the ORD laboratories have mini-computers installed and in operation. This trend is expected to continue as individual organizations obtain mini-computers, as needed.

A summary of the ADP usage growth pattern for each office is as follows:

- Office of Planning and Management (OPM). Growth in ADP usage under Scenario I is small, with no new activities or major program thrusts. Growth is higher in the near term as several existing activities are integrated and a major activity is transferred from HEW facilities to the WCC. After this developmental period, ADP usage is expected to grow less rapidly due to reduction of duplication in these systems. Scenario II (higher activity levels) would increase the rate of system enhancement. Scenario III (reduced activity levels) would restrict ADP activity usage to a minimal level with a slower rate of system enhancement.

- Office of Enforcement (OE). New enforcement programs and increased permit complexity will cause OE usage of ADP to grow slightly more than the agency in total, particularly from now until 1979. Programs for toxics, solid waste and water enforcement are the strongest growth areas in the short-term. ADP tracking systems will continue to be important as the permit process covers additional pollutants and regulations become more complex. Under Scenario II, there would be more expansion of toxics enforcement operations. Scenario III would cause some cutbacks, although ADP would not be curtailed as greatly as personnel levels.

- Office of Water and Hazardous Materials (OWHM). Growth in ADP usage under Scenario I is projected to be similar to the agency in total, with a higher rate of increase in the near term due to the impact of the

toxics program in water programs, new solid waste programs and new water supply systems. Scenario II would increase the rate of toxics program implementation and workload. Scenario III would curtail activities in local assistance, training and grants.

- Office of Air and Waste Management (OAWM). Air-related programs at NCC show an initial ADP usage growth for air quality guidelines development and then possibly a more reduced rate of growth if data handling operations can be transferred to states and regions. Scenario II would cause increases in all program areas. Scenario III would cause curtailments in many of the research and local assistance areas.

- Office of Toxic Substances (OTS). Under Scenario I, ADP usage is projected at a relatively high rate due to the activities required by the Toxic Substances Control Act. Scenario II (higher activity levels) would cause a generally higher rate of program implementation and associated ADP activity. Scenario III and reduced activity levels would slow the rate of implementation but would not eliminate any activity areas.

- Office of Research and Development (ORD). Steady growth in ADP usage is projected for ORD as quality control functions and new programs for solid waste, toxics and energy are implemented. ORD management has projected increased ADP support for data analysis and modeling activities and more use of distributed processing functions at the laboratory level. Scenario II would cause acceleration in solid waste and toxics research areas. Scenario III would cause lower priority programs and associated ADP utilization levels to be restricted.

- Staff Offices. Relatively few ADP activities are projected for staff offices and growth rates are less than the agency in total. Some limited growth will occur as existing programs for NEPA compliance and public affairs expand. The Office of International Activities is planning to utilize ADP for some of their management functions.

- Regional Offices. The ADP time-sharing growth rate in the regions is higher in the earlier period extending to 1981, then decreases as more functions are decentralized to the states. However, overall ADP workload

will steadily increase as regions utilize more local distributed processing capability in air, water, construction grants, water supply, toxics, enforcement and other programs for data collection and analysis. Efforts will be made to use the data for management decision-making and strategic planning. Additionally, the regions will devote more time to tying various individual programmatic data bases together to produce environmental quality indices and to present an overall environmental picture for geographic areas. Scenario II in higher activity levels would increase data collection and analysis levels in air, toxics, and water programs. Scenario III in reduced activity levels would cause restrictions in development of new administrative support systems with less impact on ADP activities for national systems such as GICS, STORET, SAROAD, etc.

4.4 PROJECTED COST

The data presented in previous sections of this document represent the computer workload required to meet EPA mission needs. The translation of workload to dollar cost is based on the pricing formula used by the individual facilities. To obtain these cost estimates for 1977, Informatics used seven months of actual billings from OSI and NCC to extrapolate the cost for a full year. Cost projections for 1979 (which reflect current pricing policies), were provided by the ADP activity managers. Long-term costs (1981 to 1990) were developed using the projection model, with management factors. Total costs represent only the applications operated at the two computer facilities; overhead costs are not included for either WCC or NCC.

Using the assumptions in Section 2.4, the total application cost per year is presented in Figure 4-4, for scenarios I, II, and III.

Two major changes have recently taken place which affect pricing. The IBM installation was moved from OSI to COMNET, and COMNET has a different pricing mechanism. This means a reduction

in IBM cost of approximately 20 percent per year. Secondly, a new NCC facility management contract was awarded; this will result in approximately a 15 percent increase in NCC costs. The results of applying these price changes to all costs from the two facilities for the years 1979 through 1990 are shown in Figure 4-5.

Plots of growth curves for the years 1973 to 1990 are shown in Figures 4-6 for the existing billing rates and in Figure 4-7 for the adjusted billing rates.

The distribution of costs by organizational element (AA) for each year and each scenario is shown in Figures 4-8 (Scenario I), 4-9 (Scenario II), and 4-10 (Scenario III). On these charts the lined areas of each year's value represents the IBM cost and the blank areas the UNIVAC cost. Total cost is indicated for each year. To obtain adjusted cost, the IBM cost at WCC should be reduced by 20 percent and the UNIVAC cost at NCC should be increased by 15 percent.

Year	SCENARIO I (Normal) IBM	UNIVAC	TOTAL	SCENARIO II (High) IBM	UNIVAC	TOTAL	SCENARIO III (Low) IBM	UNIVAC	TOTAL
1977	7,804	3,565	11,369						
1979	13,245	5,742	18,987						
1981	19,821	7,046	26,867	25,617	8,660	34,277	16,366	5,981	22,347
1985	30,369	10,881	41,250	44,158	15,457	59,615	22,062	7,842	29,904
1990	39,913	14,471	54,384	60,189	22,177	82,366	27,539	9,862	37,401

Figure 4-4. Total EPA Cost ($K) by Year Original Prices

Year	SCENARIO I (Normal) IBM	UNIVAC	TOTAL	SCENARIO II (High) IBM	UNIVAC	TOTAL	SCENARIO III (Low) IBM	UNIVAC	TOTAL
1977	7,804	3,565	11,369						
1979	10,596	6,603	17,199						
1981	15,857	8,103	23,960	20,494	9,957	30,453	13,093	6,878	19,971
1985	24,295	12,513	36,806	35,326	17,775	53,101	17,650	9,018	26,668
1990	31,930	16,642	48,572	48,151	25,504	73,655	22,031	11,341	33,372

Figure 4-5. Total EPA Cost ($K) by Year Adjusted Prices

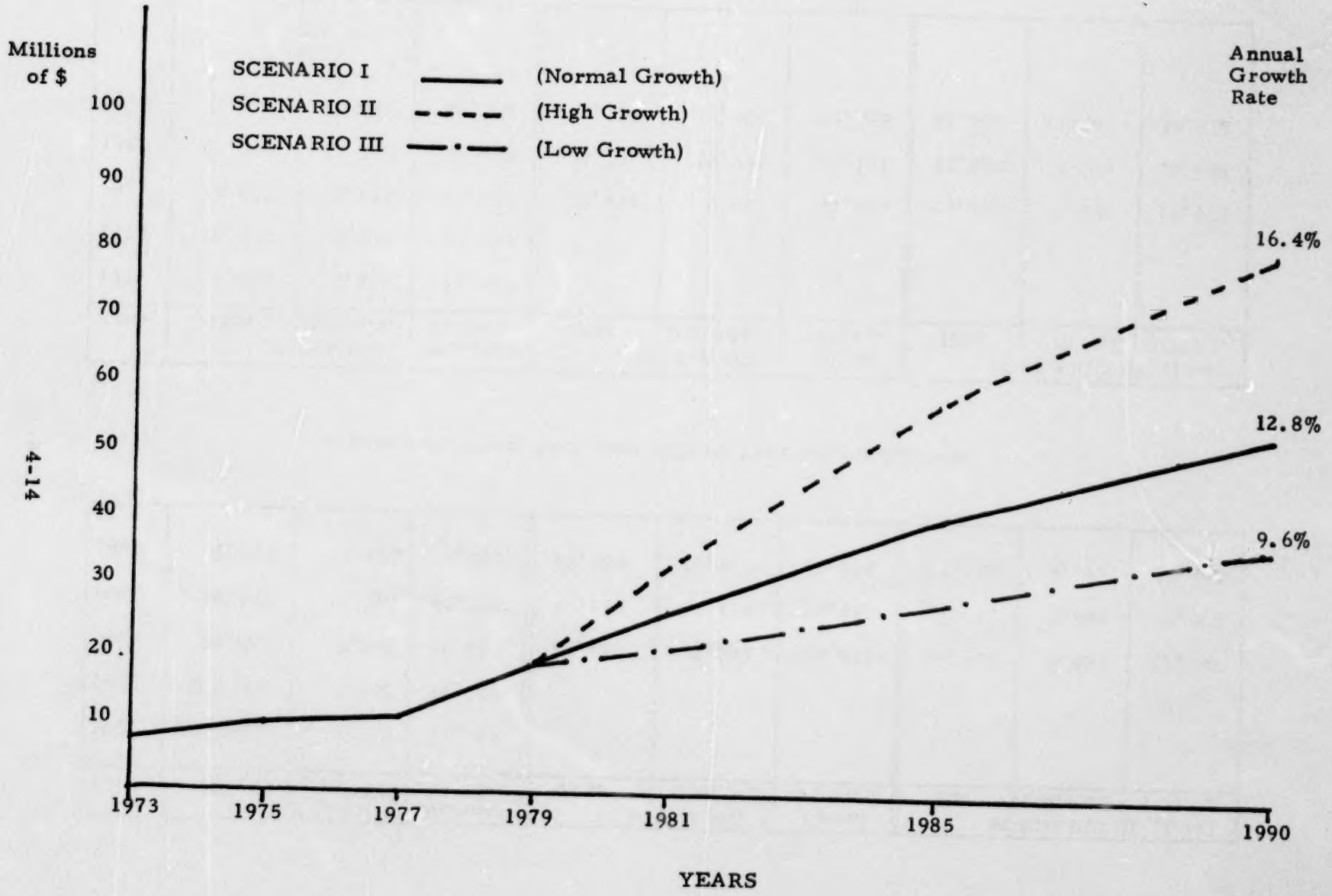

Figure 4-6. ADP Activity Cost Based on Current Billing Rates

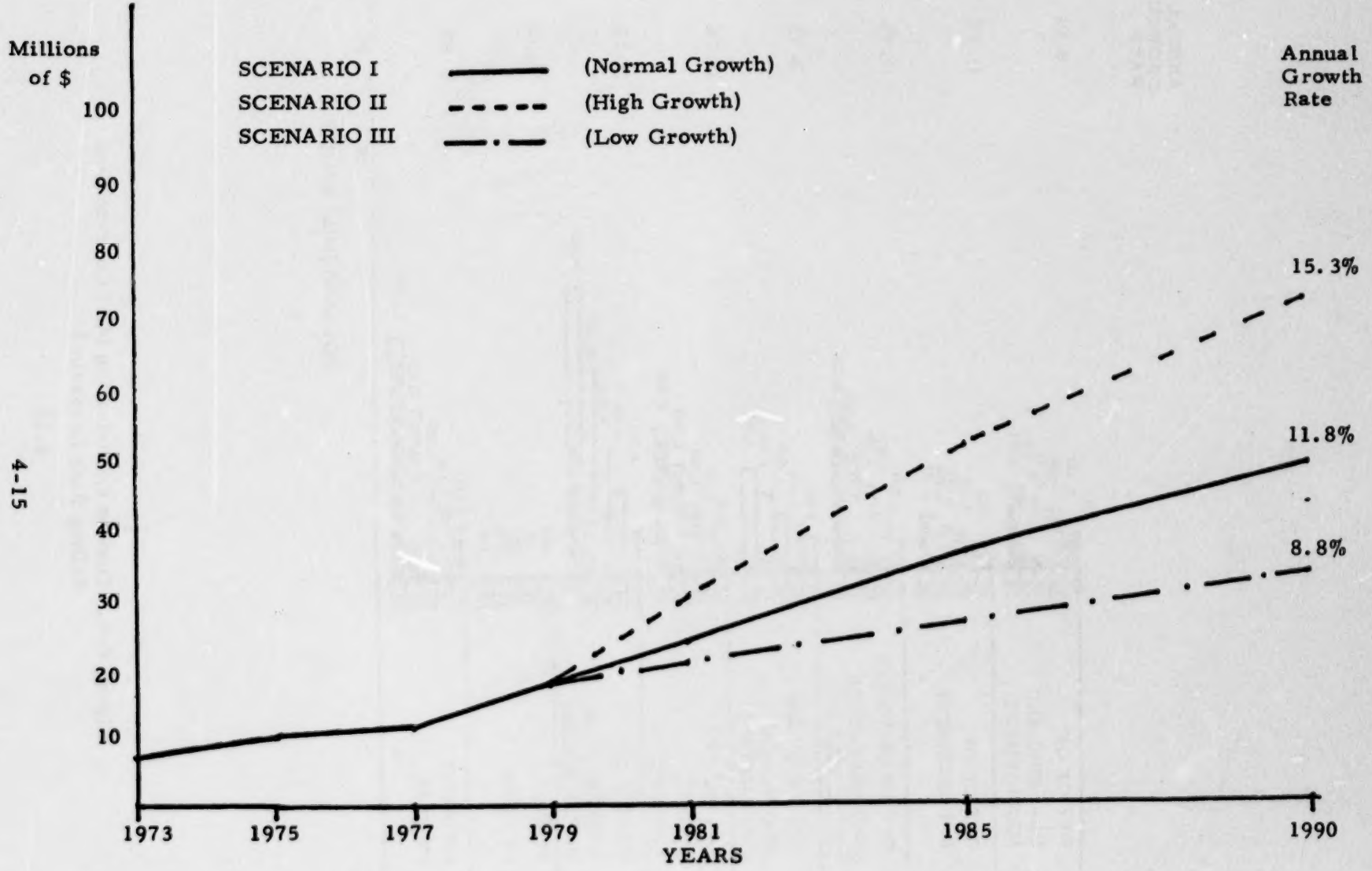

Figure 4-7. ADP Activity Cost Based on Adjusted Billing Rates

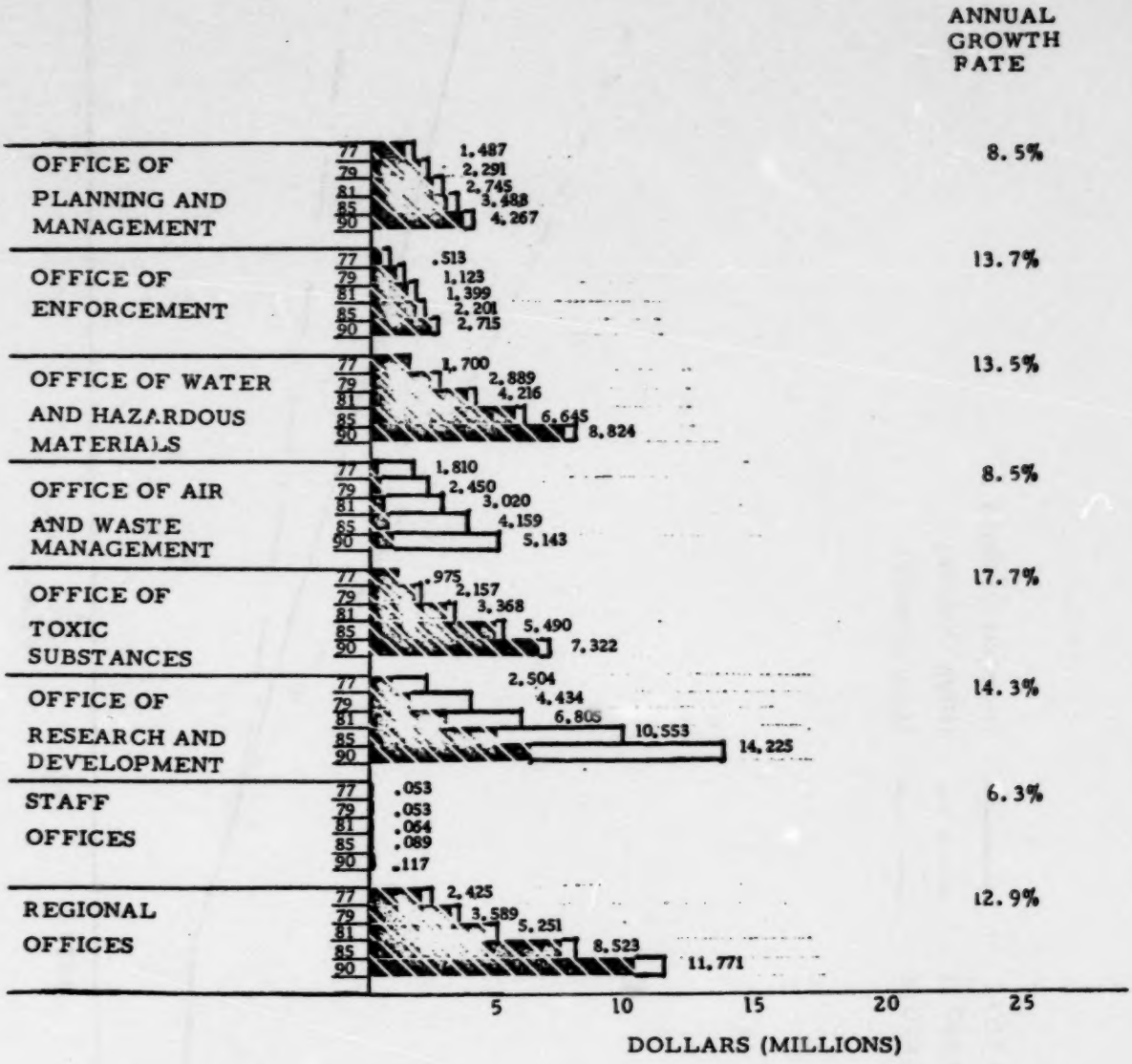

Figure 4-8. Cost by Organization (AA) Current Cost Billing Rate Scenario 1

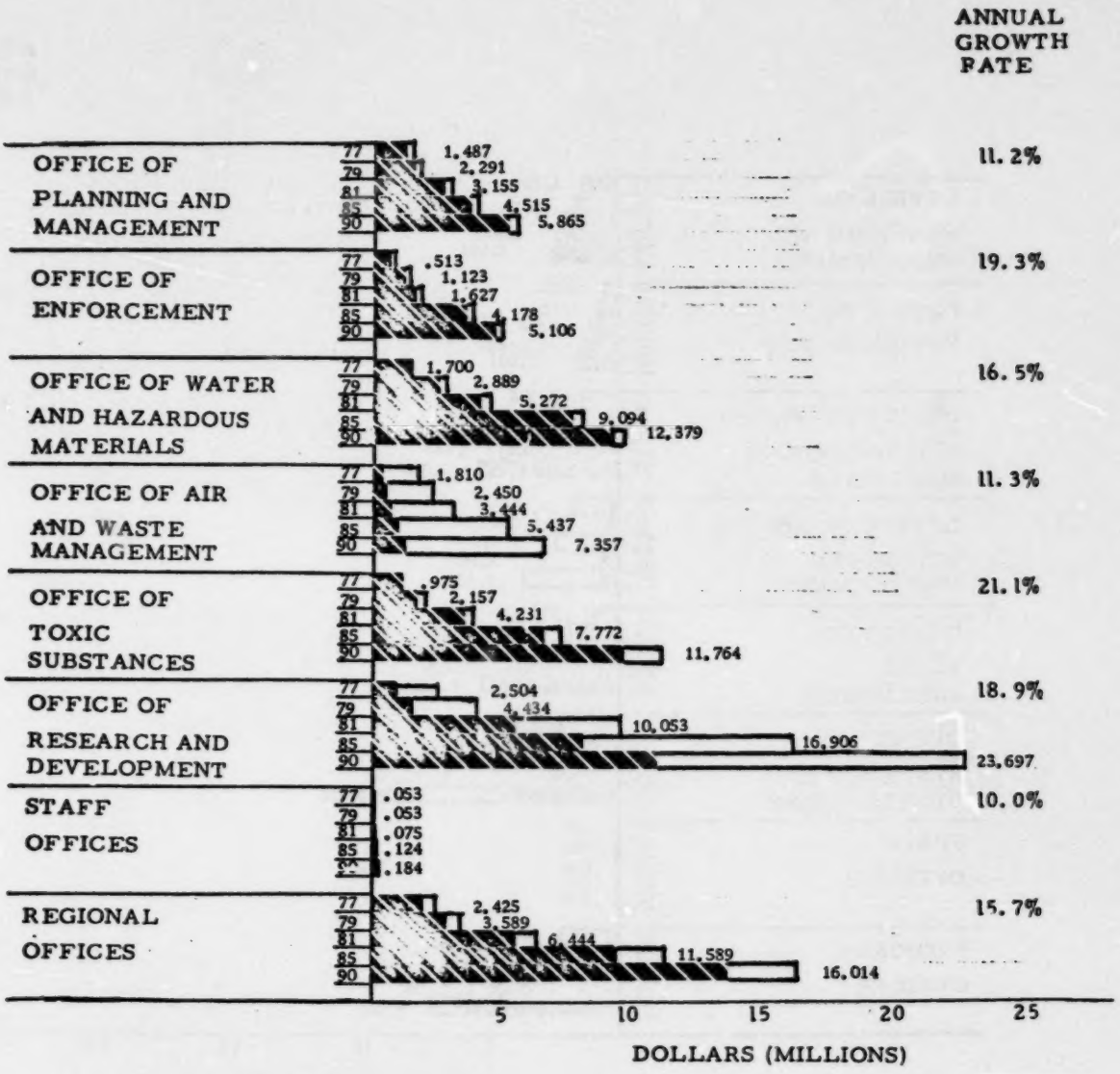

Figure 4-9. Cost by Organization (AA) Current Cost Billing Rate Scenario 2

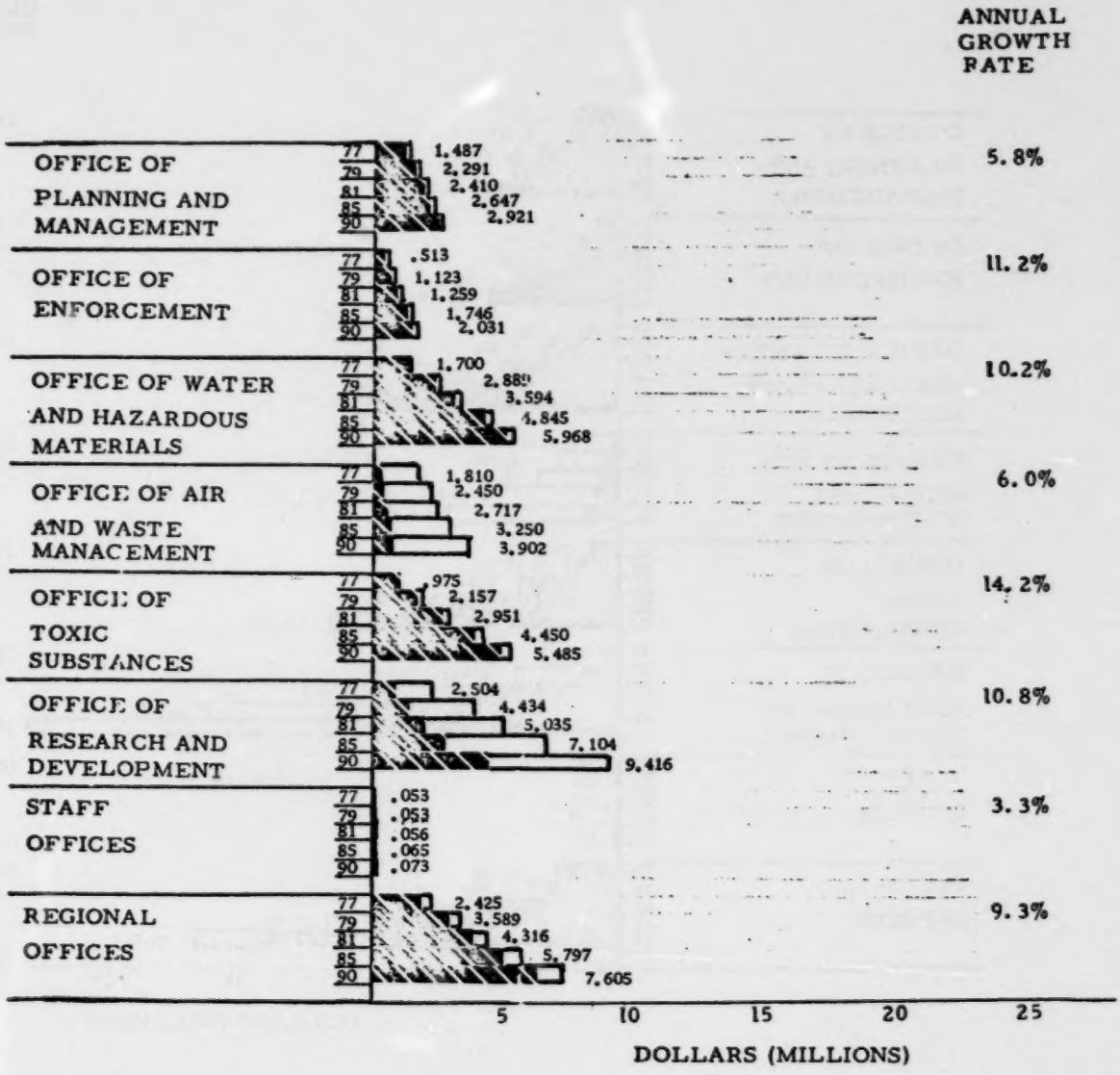

Figure 4-10. Cost by Organization (AA) Current Cost Billing Rate Scenario 3

SECTION 5

MAJOR CONCLUSIONS OF THE STUDY

5.1 INTRODUCTION

The short- and long-term trends are that the use of ADP within EPA will grow substantially over the next 13 years. The reasons for this growth are the increased responsibility given to EPA with new and expanded programs, and the education of the staff in the use of ADP. Additional manpower positions have not been made available; therefore, management has become more dependent on the use of ADP to accomplish their program objectives.

This section addresses many of the changes that will effect the future use of ADP within EPA.

5.2 MISSION CHANGES AND TRENDS IN ADP USAGE

There will be a number of macro influences on EPA growth which will have a strong bearing on the future use of ADP within EPA. Some of these influences are as follows:

- EPA management views of external influences on the agency's future tend towards a slightly more favorable growth pattern than in the past. Exceptions are programs in toxics and other health risk areas which will have more rapid growth. National economic problems and resource shortages may curtail lower priority programs because of budget pressures and redirect agency resources to higher priority programs. This is supported by the increase in both funds and positions provided by the new administration.
- Major shifts in future missions and priorities are in those programs impacted by national energy policy, legislation in health risk areas and the increasing need to focus on functions at the local level.

- Future trends in ADP usage will be influenced by needs for improved data sharing and transfer across program lines, decentralization of programs and ADP workload to the regions and increasing analytical functions.

- With all factors considered, the likelihood is that the future ADP requirements will follow more closely with Scenario I than Scenarios II or III. However, if major economic problems are not solved, EPA could revert to a Scenario III level in the 1980s.

5.3 GROWTH HISTORY COMPARISON WITH NIH

The projected EPA growth rates were compared against the history of another federal agency (National Institute of Health) which performs similar functions. The history of NIH during the period of 1967 to 1977 shows a much greater growth rate than is predicted for EPA. The size and workload of NIH in 1967 was similar to the current size and workload of EPA today. NIH has expanded to seven large main-frames during this ten year period (4-IBM 370/168, 1-IBM 370/145 and 2-DEC 10); and its workload has grown by a factor of 15 (from 20,000 jobs to 300,000 jobs) over this same period. This represents an annual growth rate of approximately 20 percent over the last six years as compared to a projected annual growth rate of 11.8 percent (normal scenario) for EPA.

5.4 PERFORMANCE AND SECURITY REQUIREMENTS

The trend is towards many more shared data bases within EPA, along with a high degree of effort expended in improving the quality of the data and maintaining security controls. Some of the future performance requirements are as follows:

- All EPA central data bases should be simultaneously accessible, subject to security controls, and internally compatible with other computers and mini-computers in the EPA systems network.

- All commonly used software packages (IRS, S2000, SPSS) should be available on all EPA central computers to enable processing of shared data bases.

- EPA central system computers must be data compatible with field mini-computer systems and must have the communications workload and security handling capability for increases in traffic over the distributed processing network.

- EPA central computer facilities should have the capability to enforce strict security controls over systems access, data base usage and internal system operation to maintain overall system integrity and high levels of operating utility.

SECTION 6

SYSTEM ACQUISITION PLAN

6.1 INTRODUCTION

The acquisition of computing resources within EPA will follow the Office of Management and Budget (OMB) Circular A-109 (Major System Acquisition) process. The individual steps required are as follows:

- o Mission analysis. The development of a statement of agency needs in the context of mission, resources and priorities. Mission needs must be presented in functional terms, not hardware.
- o Exploration of alternative system design concepts. This is acheived by obtaining the benefit of industry innovation and competition to identify the most cost beneficial system design to meet agency needs.
- o Competitive demonstration. The testing and evaluation of a part of the system to reduce risk and to determine the most cost beneficial system design.
- o Full-scale development/initial production. The conversion of existing applications to the selected system design concept and selected hardware.
- o Production. The full-scale operation of all existing systems and development of new applications under the selected system design and hardware.

6.2 MISSION ANALYSIS

OMB Circular A-109 requires a continuing analysis of current and projected mission requirements, technological opportunities, overall priorities and resources that are involved. When the analysis

identifies a deficiency in the existing agency capabilities or an opportunity to establish new capabilities in response to a technologically feasible opportunity, this will be formally presented in a mission need statement.

The combination of the Consolidated Systems Study, the Consolidated Telecommunications Study and the Conversion Study generated as a result of this contract provides a total statement of needs in functional terms. These documents present the missions to be accomplished; the agency organizational component responsible; the support requirements by year; the detailed workload and cost required to support the individual activities and summaries by organizational element; and any special operating constraints associated with the activity. These three documents represent the final products under the Informatics contract (No. GS-03S-46908). All other activities associated with the A-109 procurement process will be performed by EPA.

This total definition of mission needs is to be submitted to the EPA administrator for approval and submission to Congress in accordance with OMB Circular No. A-10. Congress has the responsibility to consider the agency needs and identify any issues requiring debate early in the acquisition process before commitment of major resources by EPA.

6.3 EXPLORATION OF ALTERNATIVE SYSTEM DESIGN CONCEPTS

Approval of mission needs by the administrator is the start of the actual major system acquisition process by granting authority to explore alternative system design concepts to meet the needs of the agency. This does not mean automatic approval of an acquisition; Congress still must approve the agency program and provide funds. The exploration of alternatives, however, can be a parallel effort with the congressional review.

As a part of this activity, the EPA administrator should name a program manager for the major system acquisition process. It will be his/her responsibility to establish the program objectives including capabilities, cost and schedule goals. A written charter will be developed which defines the authority, responsibility and accountability of the program manager. The program manager must be provided with a staff to perform the many functions for which he/she has responsibility.

The first area of responsibility is the development of an acquisition strategy. The acquisition strategy document is the primary planning tool which goes to the General Services Administration (GSA) for delegation of authority. This plan is used to make EPA management and industry aware of the EPA program and schedule. It must contain detailed statements of goals and objectives, schedules and all other considerations. The plan will provide for maximum competition in the acquisition process and establish the criteria for evaluation of alternatives.

The development of alternative system design concepts to satisfy the approved mission needs will be accomplished through a formal request to industry in the form of an RFP. This solicitation should contain a complete statement of mission or required capabilities, schedule objectives, cost objectives and operating constraints. The three documents from which the statement of needs is drawn should be made available to all prospective bidders. EPA should schedule a detailed briefing for industry representatives to present their plans and discuss details. Every effort should be made to obtain the broadest base possible of industry participation in this concept development effort. The RFP should be funded at a level to permit industry to recover most, if not all, of its cost expended in developing a concept.

This should be a multiple award contract with selection being made on the basis of proposed concept and ability to accomplish stated objectives. Multiple concepts should be considered, particularly innovative ideas which may be cost beneficial to the government. The time permitted to perform the detailed concept design should be adequate to permit the many trade-off analyses to be accomplished (5 to 9 months), including those of purchase versus lease, and government versus commercial equipment.

6.4 COMPETITIVE DEMONSTRATION

At least two of the system design contractors should be awarded contracts to demonstrate their concept. The detailed demonstration proposal will be a part of their system design concept final report. The purpose of this demonstration is to reduce or eliminate any risk associated with the concept and show that the chosen concepts are sound and will operate within the EPA environment. The demonstration must be closely supervised to determine actual cost and time to perform any conversion activities and operating time required to demonstrate the concept. EPA should select a portion of its existing activity that can be made operational using the selected concepts within a reasonable period of time. The selected activity should be such that a demonstration would be meaningful in reducing questions of risk and establish a solid baseline for estimating time and cost to become fully operational.

6.5 FULL-SCALE DEVELOPMENT/INITIAL-PRODUCTION

This stage of the process has the most effect on the system users for it includes the conversion of existing applications to the new hardware and design concept. EPA's history regarding conversion has not been favorable, particularly the conversion to the UNIVAC equipment. The actual conversion activity should be such as to permit operations on current equipment until the replacement application is fully

tested and proven operational. One of the methods which could be used is to operate parallel systems for a short period of time and compare all output activities and internal data files. A conversion which stops current operations for any period of time will be looked on by the user staff as totally unsuccessful.

Plans should be made as early as possible to maintain the current EPA hardware until the replacement applications are fully operational. Depending on the speed with which the program is approved and the new equipment selected, this may be an extention of one to three years beyond 1982.

6.6 FULL-SCALE PRODUCTION

Following the successful conversion and initial testing of an operational capability, the existing EPA applications and any new applications will be operated using the new system design concepts and equipment. New applications required after the final selection of a system design concept and equipment will be developed for that concept and equipment, therefore, no conversion will be necessary.

It is planned that the contract for full scale production will be for a period of ten years. However, EPA must build in some key milestone dates on which to review the contractor's performance, with an option to replace the personnel if necessary. During this ten year period, there will be a need to expand the hardware to meet the increasing demand for services. These expansions should be planned and options provided in the final contract to provide expanded capabilities, as needed.

6.7 OTHER FACTORS

At the current and projected rate of growth, the two existing facilities will be unable to meet all of the data processing requirements in 1982. This is when the planned replacement system is currently scheduled for installation. If the schedule slips, the new system may not be available until 1983 or later. EPA has a number of options for handling the situation. The most extreme are either to restrict growth to the existing capabilities or to obtain additional equipment and services. Another alternative is that EPA may be given authority to rent available computer time at other government installations or commercially on a short term contract. If this is the case, EPA should carefully plan the selection of those applications that would be transferred to other installations.